CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 90-067

SITE CLEANUP REQUIREMENTS FOR:

HEWLETT PACKARD
640 PAGE MILL RD.
PALO ALTO
SANTA CLARA COUNTY

STANFORD UNIVERSITY
PALO ALTO
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board), finds that:

1. Site Description Hewlett-Packard operated a manufacturing facility for gallium arsenide and silicon-based semiconductors from 1962 to 1986 at this site. The land is owned by Stanford University and has been leased by Hewlett-Packard since 1964. Hewlett-Packard is primarily responsible for this discharge and is hereinafter called a discharger for purposes of this Order. Stanford University is secondarily responsible for purposes of this Order.

2. Waste Discharge Requirements were adopted for this site on April 16, 1986 and Site Cleanup Requirements on March 15, 1989. These requirements specified a schedule for site pollution characterization and interim remediation and for the preparation of final cleanup objectives and actions. This Order is for the purpose of scheduling additional time for the investigation of the vertical and lateral extent of waste constituent degradation of State waters (currently undetermined), further evaluation of the local geology and hydrology, and further evaluation of the rate and direction of groundwater and waste constitiuent migration.

3. Site Cleanup Requirements were adopted for the groundwater beneath the former Mayfield School site (Order No. 87-142 and No. 87-164). Order No. 89-037 names both Hewlett-Packard and Varian Associates as responsible for the groundwater pollution and rescinds the previous orders.

4. The site consists of two main buildings and a storage building, as shown on Attachment 1, Site Plan, hereinafter a part of this Order. The complex housed research and production facilities associated with Hewlett-Packard's Optoelectronics Division.

5. Hydrogeology The site is located on a series of overlapping alluvial fans deposited by east-flowing streams along the

edge of the foothills of the Santa Cruz Mountains west of the site. Drilling data has shown that two major water-bearing zones are present in the upper 100 feet of sediments. These have been identified as the A and B zone. Downgradient northerly of the former underground tank to El Camino Real, a thin semi-continuous zone of lower permeability material divides the A-zone into the A-1 and A-2 zones.

6. Site History The subsurface soil and groundwater at this site are polluted with organic solvents believed to have leaked from an underground storage tank installed in 1967 for the collection of waste solvents. Compounds stored in this tank included 1,1,1 trichlorethane (TCA), trichloroethylene (TCE), toluene, acetone, isopropanol and xylene and other chemicals. The tank and 100 cubic yards of soil were excavated in 1981.

7. Soil Investigation and Remediation Sixteen soil borings were constructed in the vicinity of the former tank in 1981. The results of this work confirmed that there had been a leak from the waste solvent tank.

   A soil gas boring study was conducted during 1985. Twenty one borings were constructed and soil gas samples were analyzed. This work was conducted to determine the extent of the groundwater plume prior to the construction of groundwater monitoring wells.

   In August of 1986, five soil borings were constructed adjacent to the former tank in order to determine the extent of chemicals remaining in the soil. This indicated that significant chemicals remained in the soil (3,100,000 ppb of TCE, 800,000 ppb of TCA, 370,000 ppb of PCE, 78,000 ppb of chlorobenzene). The discharger excavated 810 cubic yards of soil in 1987 at the former tank area. Approximately 325 cubic yards of this soil was disposed of as hazardous waste, the remaining 425 cubic yards was sampled in accordance with EPA "Test Methods for Evaluating Solid Waste", EPA Document SW-846 and determined to be non-hazardous and was used to backfill the excavation. The plans for soil excavation were submitted to, and approved by the staff. Additional soil adjacent to the tank is scheduled for excavation when Hewlett-Packard Building 11 is demolished in Spring, 1990. Soils will be excavated to the concentration level of 1 PPM for volatile organic compounds.

8. Groundwater Investigations and Remediation Over seventy groundwater monitoring wells have been constructed on and off-site. The primary contaminants detected on a regular basis in these monitoring wells are 1,1,1-trichloroethane (TCA), trichloroethylene (TCE), 1,1-dichloroethane (1,1-DCA), and 1,1-dichloroethylene (DCE). Chemicals in the A zone have migrated northerly beyond El Camino Real and have been detected at the Oregon Expressway Underpass Dewatering System which is located approximately 2,900 feet from the

former underground waste solvent tank. Chemicals have also been detected to the east of the solvent tank adjacent to Page Mill Road. Additionally, a monitoring well located across Page Mill Road to the East at the Palo Alto Square shows elevated levels of similar chemicals. The discharger is installing additional wells to determine if the chemicals are coming from 640 Page Mill Road site. That investigation will also be used to determine the lateral extent of contamination and provide additional hydraulic data.

Groundwater remediation at the source was performed in 1982. Groundwater extraction at the source began again in February 1987 and extraction of groundwater in the A-1 zone beneath the former Mayfield School Site began in July 1988 and has continued to the present. The extracted water is treated by an air stripper and is then discharged to the City of Palo Alto sanitary sewer system.

9. Adjacent Investigations The Hewlett-Packard site is bordered to the northwest by the Varian Associates, 601 California Avenue facility, which is currently under Regional Board Site Cleanup Requirements for groundwater pollution beneath and downgradient of their facility. Chemicals from the Varian Associates site have merged with the discharger's plume on the former Mayfield School property located immediately northeast of the Hewlett-Packard site and down gradient of the discharger's site.

10. Based on available information the Board believes that the discharger and the Varian Associates site located at 601 California Avenue are primarily responsible for the plume of merged pollutants downgradient of the two sites including the former Mayfield School site. The Board has issued Site Cleanup Requirements to the Varian site to also investigate and propose remedial measures for their entire pollutant plume, including the portion merged with pollutants from other sites. The Board encourages the discharger and Varian Associates to jointly investigate and propose remedial measures for the merged plume area. However, if a cooperative approach cannot be arranged the discharger is still expected to comply with this Order. The Board may modify this Order to add other sites in the future and or supply information to the discharger for their cost recovery purposes.

    In addition, it is the Board's intent to continue groundwater remediation at the former Mayfield School site. This Order will supercede and rescind Order No. 89-037.

11. The Hewlett-Packard site at 395 Page Mill Road also appears to be adding chemicals to the plume at that site and down gradient of it. Board staff is currently investigating other possible sources to the commingled plume downgradient of El Camino Real. Site Cleanup Requirments will be drafted for these sources as they are discovered. The Board may modify this Order to add other sites in the future and/or supply

information to the discharger for their cost recovery purposes.

12. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives for South San Francisco Bay and contiguous surface and groundwaters.

13. The existing and potential beneficial uses of the groundwater underlying and adjacent to the dischargers facilities include:

    a. Industrial process water supply
    b. Industrial service supply
    c. Agricultural supply
    d. Municipal and domestic supply

14. The discharger caused or permitted waste to be discharged or deposited where it is or probably will be discharged to waters of the State and creates or threatens to create a condition of pollution or nuisance.

15. This action is an Order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of CEQA pursuant to Section 15321 of the Resources Agency Guidelines.

16. The Board has notified the discharger and all interested agencies and persons of its intent under California Water Code Section 13304 to prescribe Site Cleanup Requirements for the discharges and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

17. The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the discharger shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS:

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect beneficial uses of the waters of the State is prohibited.

2. Further significant migration of pollutants through subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation

and cleanup which will cause significant adverse migration of pollutants are prohibited.

B. SPECIFICATIONS:

1. The storage, handling, treatment or disposal of polluted soil or groundwater shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

2. The discharger shall conduct monitoring activities as needed to define the local hydrogeological conditions, and the lateral and vertical extent of the soil and groundwater pollution. Should monitoring results show evidence of pollution migration, additional plume characterization of pollutant extent shall be required.

3. The interim remediation of contaminated groundwater on the site and the adjacent Mayfield School site shall continue.

C. PROVISIONS:

1. The discharger shall submit to the Board acceptable monitoring program reports containing results of work performed according to a program prescribed by the Board's Executive Officer.

2. The discharger shall comply with this Order immediately upon adoption with the exception that the discharger shall comply with Prohibitions A.1., A.2., and A.3., and Specifications B.1. to B.3. as modified in accordance with the following time schedule and tasks listed below. Within sixty (60) days of the Executive Officer's determination and actual notice to Stanford University that the "primarily responsible" discharger under this Order has failed to comply with this Order, Stanford University, as landowner of the property at 640 Page Mill Road, shall itself then be responsible for complying with this Order.

<u>COMPLETION DATE/TASK:</u>

a. 1) COMPLETION DATE: July 29, 1990
TASK: INTERIM PROGRESS REPORT - THE LATERAL AND VERTICAL EXTENT OF CONTAMINATION: The discharger shall submit a technical report acceptable to the Executive Officer that describes the known vertical and lateral extent of groundwater contamination coming from the site.

b. 1) COMPLETION DATE: November 8, 1990
TASK: INTERIM PROGRESS REPORT - THE LATERAL AND VERTICAL EXTENT OF CONTAMINATION: The discharger shall submit a technical report acceptable to the Executive Officer that describes the known vertical and lateral extent of groundwater contamination coming from the site.

c. 1) COMPLETION DATE: January 15, 1991
TASK: FINAL REPORT - THE LATERAL AND VERTICAL EXTENT OF CONTAMINATION: The discharger shall submit a technical report acceptable to the Executive Officer that describes the vertical and lateral extent of groundwater contamination coming from the site. The report shall also include an evaluation of the zone of capture for the Oregon Expressway underpass dewatering system.

2) COMPLETION DATE: January 15, 1991
TASK:PROPOSED FINAL CLEANUP OBJECTIVES AND ACTIONS: Submit a technical report acceptable to the Executive Officer containing the results of the feasibility study evaluating alternative final remedial measures; and a separate technical report acceptable to the Executive Officer containing the recommended measures necessary to achieve final cleanup objectives; and the tasks and time schedule necessary to implement the recommended final remedial measures.

All investigative work proposed by the discharger for purposes of complying with this Order, shall be submitted to and approved by the Executive Officer before work commences. These proposals may be in letter format, and shall include the data necessary to adequately evaluate the proposal. Draft technical data, e.g. boring logs or chemical analyses results, shall be submitted to staff monthly, or upon request, after completion of the boring or sampling. The submittal of technical reports evaluating immediate, interim and final remedial measures will include a projection of the cost, effectiveness, benefits and impact on public health, welfare and environment of each alternative measure. The remedial investigation and feasibility study shall be consistent with the guidance provided by Subpart F of the National Oil and Hazardous

Substances Pollution Contingency Plan (40 CFR Part 300); Section 25356.1 (c) of the California Health and Safety Code; CERCLA guidance documents with reference to Remedial Investigation, Feasibility Studies, and Removal Actions; and the State Water Resources Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".

3. If the discharger is delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the discharger shall promptly notify the Executive Officer and the Board may consider revision to this Order.

4. Technical reports on compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted monthly to the Board commencing with the report due June 17, 1990 monitoring the previous months activities. On a monthly basis thereafter, these reports shall consist of a letter report that, (1) summarizes work completed since submittal of the previous report, and work projected to be completed by the time of the next report, (2) identifies any obstacles which may threaten compliance with the schedule of this Order and what actions are being taken to overcome these obstacles, and (3) includes, in the event of non-compliance with Provision C.2. or any other Specification or Provision of this Order, written notification which clarifies the reasons for non-compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order. As an alternative to the monthly report, the discharger may converse weekly by telephone with Board staff on the status of work at the site, except for instances of non-compliance with this order.

On a quarterly basis, commencing with the report due August 17, 1990 the quarterly reports shall include, but need not be limited to, updated water table and piezometric surface maps for all affected water bearing zones, cross-sectional geological maps describing the hydrogeological setting of the site, and appropriately scaled and detailed base maps showing the location of all monitoring wells and extraction wells, and identifying adjacent facilities and structures.

5. The discharger shall submit to the Board technical reports acceptable to the Executive Officer. Chemical plume definition and remedial investigations shall be conducted, and technical reports prepared to meet all applicable performance goals listed below as necessary to complete the Remedial Investigation/Feasibility Study (RI/FS):

CHEMICAL ASPECTS:

1. The discharger's plume should be defined laterally and vertically by water quality measurements and for all chemicals released from the discharger's site, and their transformation products within a plume or commingled plume, at least to the level of appropriate water quality criteria. If the discharger proposes a boundary for its chemicals released from the discharger's site within a commingled plume, then the discharger shall present positive proof that all chemicals beyond the proposed boundary did not originate from the discharger's site.
2. The source of chemicals should be identified for each point of discovery.
3. The chemical, physical, and biological fate, e.g. adsorption, biodegradation, transformation, etc., should be determined for each chemical (and/or transformation product) released from the discharger's site within a plume.
4. All sampling should be done in a manner that ensures the highest degree of accuracy and precision pursuant to approved Quality Assurance Project Plans, or Site Sampling Plans.
5. The chemical distribution pattern within the saturated soil should be established to an extent sufficient to maximize remedial efficiency.

HYDROGEOLOGIC ASPECTS:

1. Lithologic units should be monitored individually so that chemical concentrations, both original chemicals and their daughter products, within each individual unit are determined.
2. The entire hydrostratigraphic unit should be adequately monitored to ensure both a representative and nondilute sample. This should occur at the plume boundaries and at other locations to provide support for investigative conclusions, and to confirm the adequacy and efficiency of remediation.
3. A sufficient number of monitoring wells should be installed to ensure that all classes of chemicals, e. g. "sinkers" versus "floaters", are detected and monitored.
4. Hydraulic interconnections, either vertical or

lateral, and the effect of any interconnections on chemical movement should be documented and defined.

5. Hydraulic information for the investigative area should be of sufficient quantity and quality to maximize extraction efficiency during remediation.

GEOLOGIC ASPECTS:

1. Sampling during well, boring or piezometer installation should ensure the following:
    a. that information is obtained for 100% of the subsurface.
    b. that detailed lithologic and physical descriptions with estimates of the amount of lithologic constituents are obtained in addition to any other classification systems.
    c. that the individual chemical concentrations of each lithologic strata within the borehole are determined by a reliable and systematic manner of sampling when sampling is done to meet the above goals.
2. Hydrostratigraphic zones should be defined by documenting the existence of a significant, continuous and widespread aquitard underlying both the specific well location and the entire investigative areas. Should the hydrostratigraphic zone remain undefined because such documentation is not provided, continued vertical migration will be considered possible throughout the area and monitoring beneath the contaminated zone will be required.
3. Critical lithologic designations should be confirmed by laboratory analysis.
4. Stratigraphic correlations should be done utilizing lithologic logs in conjunction with additional data on the physical characteristics of the strata obtained from methodologies other than those used to produce the lithologic logs.

6. All hydrogeological plans, specifications, reports, and documents shall be signed by or stamped with the seal of a registered geologist, engineering geologist or professional engineer. This requirement shall not apply to monthly reports and quarterly progress reports provided the hydorgeological information contained in these reports has been submitted or is scheduled for submittal by a registered geologist, engineering geologist, or professional engineer.

7. All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality

assurance/quality control records for Board review.

8. The discharger shall maintain in good working order, and operate as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

9. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, shall be provided to the following agencies:

    a. Santa Clara Valley Water District
    b. Santa Clara County Health Department
    c. City of Palo Alto
    d. State Department of Health Services/TSCD
    e. U. S. Environmental Protection Agency, Region IX

    The Executive Officer may additionally require copies of correspondence, reports and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order to be provided to a local repository for public use and for compilation of an Administrative Record.

10. The discharger shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code:

    a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order.

    b. Access to copy any records required to be kept under the terms and conditions of this Order.

    c. Inspection of any monitoring equipment or methodology implemented in response to this Order.

    d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.

11. The discharger shall file a report on any changes in site occupancy and ownership associated with the facility described in this Order within 60 days of said changes.

12. If any hazardous substance is discharged in or on any waters of the state, or discharged and deposited where

it is, or probably will be discharged in or on any waters of the state, the dischargers shall report such discharge to this Regional Board, at (415) 464-1255 on weekdays during office hours from 8 a.m. to 5 p.m., and to the Office of Emergency Services at (800) 852-7550 during non-business hours. A written report shall be filed with the Regional Board within five (5) working days and shall contain information relative to: the nature of waste or pollutant, quantity involved, duration of incident, cause of spill, Spill Prevention, Control, and Countermeasure Plan (SPCC) in effect, if any, estimated size of affected area, nature of effects, corrective measures that have been taken or planned, and a schedule of these activities, and persons/agencies notified.

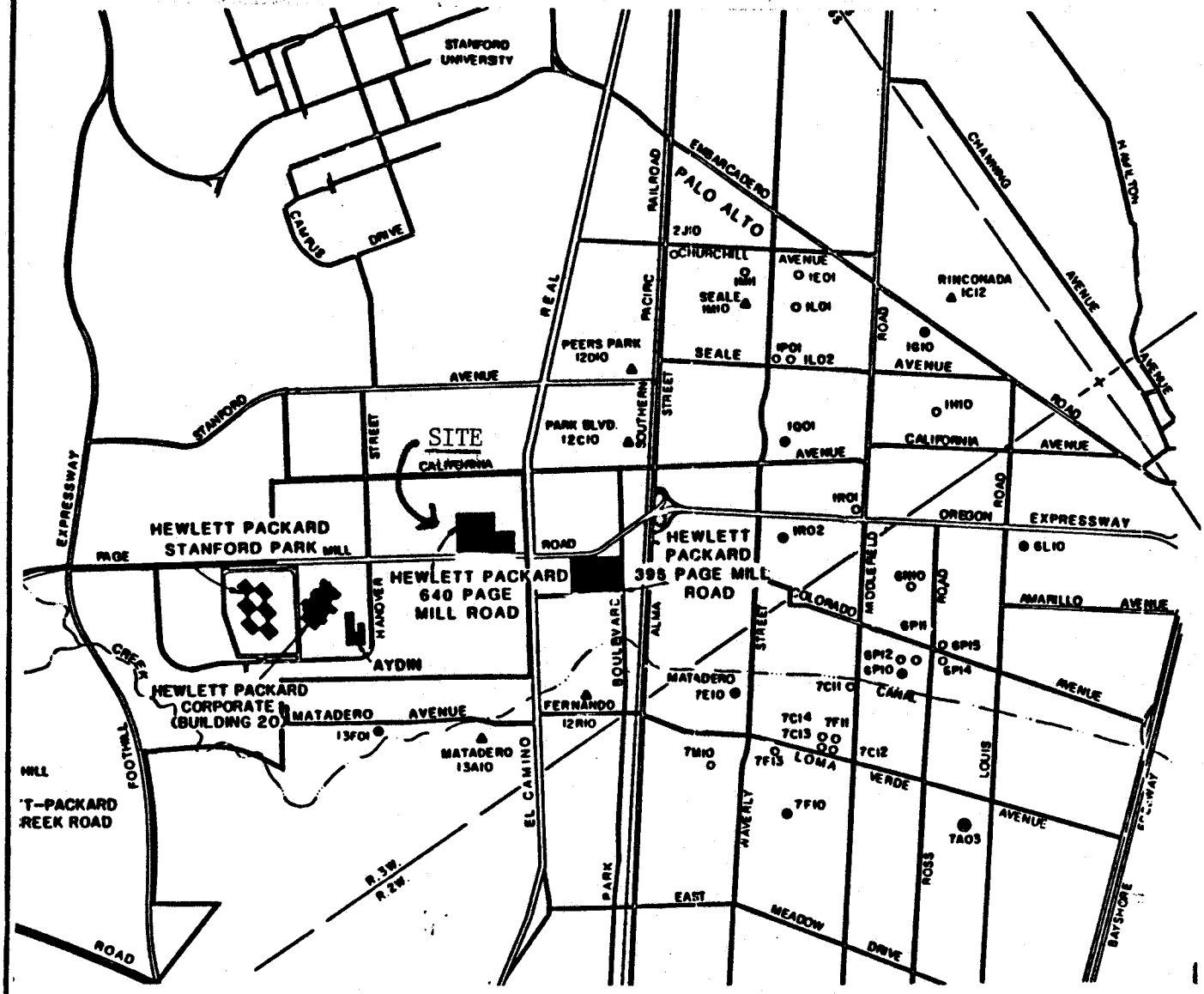
13. The Board will review this Order periodically and may revise the requirements when necessary.

14. Regional Board Order No. 89-037 is hereby rescinded.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on May 16, 1990.

Steven R. Ritchie
Executive Officer

Attachment: Attachment 1
Self Monitoring Program



STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ATTACHMENT 1

Site Location

DRAWN BY:	DATE:	DRWG. NO.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION

HEWLETT-PACKARD COMPANY
640 PAGE MILL ROAD
GROUNDWATER SELF-MONITORING PROGRAM

A. GENERAL:

Reporting responsibilities of waste dischargers are specified in Section 13225(a), 13268, 13383, and 13387 (b) of the California Water Code and this Regional Board's Resolution No. 73-16.

The principal purposes of a waste discharger's monitoring program, also referred to as a self-monitoring program, are: (1) To document compliance with waste discharge requirements and prohibitions established by this Regional Board, (2) To facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge, (3) To develop or assist in the development of effluent or other limitations, discharger prohibitions, national standards of performance, pretreatment and toxicity standards, and other standards, and (4) To prepare water and wastewater quality inventories.

B. SAMPLING AND ANALYTICAL METHODS

Sample collection, storage, and analyses shall be performed according to the EPA Method 8000 series described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", dated November 1986; or other methods approved and specified by the Executive Officer of this Regional Board.

All reporting and detection limits for all analyses must be less than the state action level, or the Maximum Contaminant Level, whichever is smaller.

Turbidity measurements in NTU units shall be made immediately before a water sample is taken for chemical analysis, and the results shall be reported to the Board with the quarterly sampling data.

Chemical analyses for the following chemicals shall be done quarterly in addition to the EPA 8010 as required in Table 1.

C. REPORTS TO BE FILED WITH THE REGIONAL BOARD

1. Violations of Requirements

In the event the discharger is unable to comply with the conditions of the waste

discharge requirements and prohibitions due to:
a. maintenance work, power failures, or breakdown of waste treatment equipment, or
b. accidents caused by human error or negligence, or
c. other causes such as acts of nature, or
d. poor operation or inadequate system design,

the discharger shall file a written technical report at least 15 days prior to advertising for bid on any construction project which would cause or aggravate the discharge of waste in violation of requirements; said report shall describe the nature, costs, and scheduling of all action necessary to preclude such discharge.

In addition, if the noncompliance caused by items (a), (b), (c) or (d) above is with respect to any of the Order's limits, the waste discharger shall promptly accelerate the monitoring program to weekly or as required by the Board's Executive Officer for those constituents which have been violated. Such analysis shall continue until such time as the effluent limits have been attained, or until such time as the Executive Officer dertermines to be appropriate. The results of such monitoring shall be included in the regular Self-Monitoring Report.

2. Self-Monitoring Reports

a. Sampling Period:

Sampling episodes shall be coordinated with the sites of Aydin and Varian 611 Hansen Way, Varian site at 601 California Avenue and the Hewlett-Packard site at 395 Page Mill Road, and any other sites in the area that may be regularly sampled in the future, such that water level elevations from all the sites are taken at the same time.

b. Reporting Period:

Written reports shall be filed regularly each quarter within forty-five days from the end of the quarter monitored.

c. Letter of Transmittal:

A letter transmitting self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period and actions taken or planned for correcting any requirement violation. If the discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to this correspondence will be satisfactory. Monitoring reports and the letter transmitting reports shall be signed by either a principal executive officer or his duly authorized employee. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true and correct.

d. Data Results:

1. Results from each required analysis and observation shall be submitted in the quarterly self-monitoring reports. GC/MS analysis shall be performed and all peaks identified and reported on each well according to Table 1 and on each new well immediately after installation and well development. Results shall also be submitted for any additional analyses performed by the discharger at the specific request of the Board.

2. The quarterly reports shall identify the analytical procedures used for analyses directly in the report. Any special methods shall be identified and shall have prior approval of the Board's Executive Officer.

3. The currently used sampling techniques and equipment must be demonstrated, to the satisfaction of the Executive Officer, to produce the best results of all available technologies and equipment for the constituents of concern. If this is not done, a change to the techniques and equipment producing better data will be required. Justification acceptable to the Executive Officer must be given and approval obtained before the use of sampling techniques or equipment that have not been demonstrated to produce the best results of all available technology for the constituents of concern.

4. The quarterly reports shall include but not be limited to:

   a. groundwater elevations for all wells
   b. updated water table and piezometric surface maps for all affected water bearing zones
   c. geologic cross sections showing boring log lithology with the units on the sections named and correlated in accordance with the percentages of lithologic constituents and mineralogy shall be prepared. Vertical and horizontal scales should be consistent for all cross-sections. Use of vertical exaggeration in the construction of cross sections shall be limited and never more than 10 times the horizontal scale
   d. appropriately scaled and detailed base maps showing the location of all monitoring wells and extraction wells and identifying adjacent facilities and structures
   e. summary table of the results of turbidity measurements in NTU units, and the chemical analyses that includes all the data from all the wells since sampling began
   f. summary table of monitoring wells showing dates of construction, top of casing elevations, ground surface elevations, depth of boring, borehole diameter, casing diameter, depth of casing, depth of screened interval, screened lithology, and length of screen
   g. summary table showing well name, date of most recent measurement of water levels, most recent and historical water level elevation data, and screen elevation referenced to mean sea level
   h. appropriately scaled base maps each showing the latest chemical concentrations of the major chemicals of concern and the chemicals with the lowest action levels
   i. table showing the results of the latest chemical sampling round and NTU

measurements

j. copies of all technical data collected during the quarter

k. if four or more new soil borings or wells are completed during any quarter, updated geological cross sections shall be provided in the quarterly report for that quarter

l. chain of custody sheets, and laboratory sheets documenting the condition of the sample upon receipt (if not given on custody sheet)

m. Isoconcentration maps for both parent chemicals and transformation products within each hydrostratigraphic unit shall be provided to the Board

n. Potentiometric maps for each hydrostratigraphic unit shall be provided to the Board, provided adequate documentation that compatible screen elevations, screen lithologies, similar confining conditions (all confined, unconfined, or semi-confined) exist within the units, and adequate evidence that the wells used are within the same hydrostratigraphic unit has been submitted to demonstrate that potentiometric maps are appropriate at the site

o. The locations and results of samples taken for laboratory and/or field analysis shall be reported in the body of the report and the procedure used in sample collection and testing shall be described. The location of any sample tested and the results of the test shall be noted on a well, boring or piezometer log at the appropriate location

p. In addition to the other information, boring logs shall include the following data:

1. The name of the geologist/technician who actually performs the logging.
2. The method and type of equipment used in drilling, the type of drilling fluid used, the type of sampling device used, and blow counts.
3. The composition of the well construction materials.
4. Initial and stabilized water levels.
5. Surveyed top of casing elevations, ground surface elevations, and well locations in latitude and longitude. The surveying shall be done by a licensed surveyor and shall be referenced to a first order benchmark of known latitude, longitude, and elevation.
6. Detailed lithologic descriptions, including estimates of the amount of lithologic constituents, notes of odors, rootholes, stains, etc., in addition to Unified Soil Classification System.
7. Screen type, composition, and location.
8. Filter pack location and composition.
9. Well construction details.
10. Locations of samples taken for physical analysis to confirm the compatibility of the formation with the filter pack and screen slot size, or for any other analyses shall be noted. The results of the analyses shall be shown on the log in the appropriate location.
11. The sample number, location of sample, how much of the sample was recovered (in inches) shall be shown on the boring log. The method used to sample shall be indicated on the boring log.
12. Moisture content of each lithologic unit. Any variations within a unit shall be noted on the log.

13. The scale of the log shall at an acceptable scale and geophysical logs shall have the same scale as the lithologic logs. Tick marks shall be made at no more than one foot intervals.

q. Purging information and physical parameter measurements collected during water quality sampling shall be included in the quarterly reports.

5. The following data shall be submitted to the Board within one month of collection, as specified, and/or upon request:

   a. Well development data, including but not limited to, the time needed for development, turbidity in NTU units at the beginning and end of development, whether the well was dewatered, and estimates of how much water was removed before dewatering.
   b. The inside depth to the bottom of a monitoring well should be periodically measured (at least once a year) and the results submitted to the Board.
   c. Copies of chromatographs shall be submitted in addition to the results of the tests for any fuel hydrocarbon compounds.
   d. Board staff shall be notified in writing and the notice shall arrive at the Board five working days in advance of the commencement of drilling, investigative and/or sampling activities. A schedule detailing which well is to be sampled/drilled at which time shall be included in the written notification. Board staff shall be promptly notified of any changes in the schedule.
   e. All data submitted to the Board shall have the well, boring, piezometer, or other location designation clearly marked on all data sheets. The date and time the sample is collected, delivered to the laboratory, analyzed, and reported shall be included on each laboratory data sheet. The depth the sample was taken shall be included on all data sheets for soil boring samples. (legible handwriting is acceptable).
   f. All maps and diagrams submitted to the Board shall only show the location of the data that was used in the preparation of the map or diagram, with the exception of well location maps.

6. Hewlett-Packard Company shall describe, in the quarterly Self-Monitoring Report, the reasons for significant increases in a waste constituent at a well. The description shall include, but not be limited to:

   a. the source of the increase
   b. how Hewlett-Packard Company determined or will determine the source of the increase, and
   c. what source removal measures have been completed or will be proposed.

7. Original lab results shall be retained and shall be made available for inspection for three years after origination or until after all continuing or impending legal or administrative actions are resolved.

8. The quarterly reports shall include a discussion of unexpected operational changes which could affect performance of the extraction system, such as

flow fluctuations, maintenance shutdown, etc.

9. Hewlett-Packard Company shall describe in the quarterly monitoring report the effectiveness of the actions taken to regain compliance if compliance is not achieved. The effectiveness evaluation shall include the basis of determining the effectiveness.

10. Hewlett-Packard Company shall submit the results of any testing of effluent from the extraction wells.

11. An annual report shall be combined with the fourth quarter regular report and shall include cumulative data for each well. The annual report shall also include minimum, maximum, median, and average water quality and water level elevation data for the year.

e. Self-Monitoring Report Revisions:

Additional long term or temporary changes in the sample collection frequency, sampling techniques or requirements, and routine chemical analysis may become warrented as monitoring needs change. These changes shall be based on the following criteria and shall be proposed in a quarterly self-monitoring report. The changes shall be implemented only upon receipt of written approval from Board staff.

Criteria for revision:

1. Discontinued analysis for a routine chemical parameter for a specific well after a one year period of below detection limit values for that parameter.
2. Changes in the sampling frequency for a specific well after a one year period of below detection limit values for all waste constituents from that well.
3. Temporary increases in sampling frequency or changes in requested chemical parameters for a well or groups of wells because of a change in data needs (e.g., evaluating groundwater extraction effectiveness or other remediation strategies).
4. Alteration of sampling frquency based on evaluation of collective data base.

D. DESCRIPTION OF SAMPLING STATIONS

GROUNDWATER

STATIONS	DESCRIPTION
Listed in Table 1	Monitoring wells

E. SCHEDULE OF SAMPLING AND ANALYSIS

The schedule of sampling and analysis shall be given in Table 1.

I, Steven R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data established in Regional Board Order No. 90-067

2. Is effective on the date shown below.

3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger and revisions will be ordered by the Executive Officer.

Steven R. Ritchie
Executive Officer

Effective Date: May 16, 1990
Attachments: Table 1

TABLE I

STATION	FREQUENCY	ANALYSIS	EXTRA CHEMICALS	YEARLY TEST
06A	QUARTERLY	8010 G	SET B	8240
08AB	QUARTERLY	8010 G	SET B	8240
F21A1	QUARTERLY	8010 G	SET B	8240
F30A1	QUARTERLY	8010 G	SET C	8240
F31A2	QUARTERLY	8010 G	SET C	8240
F32A2	QUARTERLY	8010 G	SET C	8240
F42A1	QUARTERLY	8010 G	SET C	8240
F79D	QUARTERLY	8010 G	SET C	8240
F42B	QUARTERLY	8010 G	SET C	8240
SC-1	QUARTERLY	8010 G	SET C	8240
F87D	QUARTERLY	8010 G	SET C	8240
F59A1	QUARTERLY	8010 G	SET C	8240
F60A2	QUARTERLY	8010 G	SET C	8240
F77S	QUARTERLY	8010 G	SET C	8240
F76D	QUARTERLY	8010 G	SET C	8240
F75S	QUARTERLY	8010 G	SET C	8240
F74D	QUARTERLY	8010 G	SET C	8240
03A2	BIANUALLY	8010 G		8240
04A	BIANUALLY	8010 G		8240
05A	BIANUALLY	8010 G		8240
010A	BIANUALLY	8010 G		8240
017B	BIANUALLY	8010 G	SET B	8240
F33B	BIANUALLY	8010 G	SET C	8240

LEGEND
G = GRAB SAMPLE
SET A = TOLUENE, BENZENE, ETHYLBENZENE, FREON 113
SET B = TOLUENE, ETHYLBENZENE, XYLENE, FREON 113, ACETONE, DICHLOROMETHANE
SET C = TOLUENE, BENZENE, ETHYLBENZENE, FREON 113, XYLENE, ACETONE, DICHLOROMETHANE
SET D = FREON 113

EPA 8010/8020 NOT REQUIRED WHEN EPA 8240 IS PERFORMED
EPA 8240 SHALL BE PERFORMED WITH AN OPEN SCAN
EPA 8010/8020 FOR: PURGEABLE PRIORITY POLLUTANTS